Representation of women amongst speakers at the Canadian Anesthesiologists' Society annual meeting: a retrospective analysis from 2007 to 2019

Représentation féminine parmi les conférenciers du Congrès annuel de la Société canadienne des anesthésiologistes: une analyse rétrospective de 2007 à 2019

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Abstract

Purpose Despite an increase in the proportion of women entering the field of anesthesiology, women remain underrepresented in academic and leadership positions. Speaking at national and international conferences is an important component of academic visibility and promotion.

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To date, the gender representation of speakers at the Canadian Anesthesiologists' Society (CAS) annual meeting has not been examined.

Methods We conducted a retrospective analysis of the representation of women amongst speakers at the CAS annual meeting between 2007 and 2019, inclusively. We also examined the representation of women in different subspecialty subject area symposia at each CAS annual meeting, and the gender composition of meeting symposia panels (i.e., groups of two or more speakers in a session) at the meeting.

Results Overall, 28.5% (358/1,256) of speaker slots included women, similar to their representation in Canadian clinical anesthesiology over the study period (26.7%), and increasing significantly over the study period. Women were more highly represented as obstetric anesthesia speakers at the CAS annual meetings, with lower representation in cardiothoracic anesthesia, transplant anesthesia, and critical care symposia. Of the 311 meeting symposia, 146 (46%) were composed of all men speakers.

Conclusion The representation of women speakers at the CAS annual meeting was similar to the representation of women in the anesthesiology workforce in Canada over the study period. Gender representation varied widely by subspecialty symposia, subject area, and women were absent from nearly half of all symposia at the CAS annual meetings, which are potential areas of future investigation and intervention.

Résumé

Objectif Malgré une augmentation de la proportion de femmes décidant de poursuivre une carrière en

anesthésiologie, celles-ci demeurent sous-représentées dans les postes universitaires et de leadership. Le fait de présenter lors de congrès nationaux et internationaux est une composante importante de la visibilité et de l'obtention de promotions dans le milieu académique. À ce jour, la représentation hommes/femmes des conférenciers prenant la parole dans le cadre du Congrès annuel de la Société canadienne des anesthésiologistes (SCA) n'a pas été étudiée.

Méthode Nous avons réalisé une analyse rétrospective de la présence des femmes parmi les conférenciers des congrès annuels de la SCA tenus de 2007 à 2019 inclusivement. Nous avons également examiné la représentation des femmes lors des divers symposiums de surspécialité de chaque congrès annuel de la SCA, et la composition hommes/femmes des panels des symposiums (c.-à-d. des groupes de deux conférenciers ou plus dans une séance) lors des congrès.

Résultats Globalement, 28,5 % (358/1256) des créneaux de conférence incluaient des femmes, un chiffre qui reflète bien leur représentation en anesthésiologie clinique au Canada pour la période à l'étude (26,7 %); ce chiffre augmentait significativement au cours de la période étudiée. Les femmes étaient plus représentées parmi les conférenciers en anesthésie obstétricale lors des congrès annuels de la SCA, mais moins représentées en anesthésie cardiothoracique, en anesthésie pour transplantation et dans les symposiums de soins critiques. Sur les 311 symposiums de congrès, 146 (46 %) étaient composés exclusivement de conférenciers masculins.

Conclusion La représentation de femmes conférencières lors des congrès annuels de la SCA était semblable à la représentation des femmes en anesthésiologie au Canada au cours de la période étudiée. La représentation hommes/femmes variait considérablement d'un symposium de surspécialité à un autre et les femmes étaient absentes de près de la moitié de tous les symposiums lors des congrès annuels de la SCA, ce qui constitue des domaines potentiels d'étude et d'intervention futures.

Gender disparity in the medical profession remains a pervasive issue and extends into many aspects of academic medicine.^{1–3} Previous publications have shown gender disparities in training evaluations,^{4,5} academic publishing,^{6,7} hiring, promotion,³ harassment,⁸ recognition,⁹ and remuneration.^{10,11} Despite a continual increase in the proportion of women anesthesiologists (32.6% in Canada in 2018)¹² women remain underrepresented as journal article authors,⁶ on editorial

boards,^{7,12,13} and in leadership roles of national societies.^{14,15} Social science research has found that increasing both the number of women and their visibility reduces bias. That is, individuals exposed to women leaders within the last two years improved perceptions of women leaders' effectiveness, with resulting weakened gender stereotypes, and increased elections for positions on council for women.¹⁶ Therefore, addressing these disparities is critical. Potential solutions include highlighting the accomplishments of women at academic meetings and enhancing the visibility of successful women; these women act as role models for trainees and colleagues and help in engaging young women.¹⁶

National and international recognition are an important aspect of academic conferences. Underrepresentation of women at academic meetings has been raised as one source of gender inequity and has been identified in critical care medicine,^{17,18} the American Society of Anesthesiologists annual meeting,¹⁹ and other medical conferences in Canada and the United States.²⁰ To date, the representation of women speakers at the Canadian Anesthesiologists' Society (CAS) annual meeting has not been examined in detail, nor the representation amongst different subspecialty symposia (i.e., "panels" with groups of two or more speakers in a session), subject areas, and symposia sizes. Thus, our primary objective was to determine the representation of women speakers at the CAS annual meeting relative to their proportion in the anesthesiology workforce in Canada, including the trends over time. Our secondary objectives were to determine the representation of women amongst the various subspecialty symposia subjects, and to calculate the representation of single gender symposia at the CAS annual meeting.

Methods

Design

We conducted a retrospective analysis of the gender of speakers at the CAS annual meeting between 2007 and 2019, inclusively. We chose this timeframe as the first published (i.e., publicly available) CAS annual meeting agenda was in 2007. Institutional research ethics board approval was not required as we included only publicly available data from the Internet, using published conference programs.

Study population

We included all speaker slots at the CAS annual meeting from 2007 (i.e., first published CAS annual meeting agenda) to 2019 inclusive. If the same individual

presented in two separate slots, they were counted in both slots and each speaker on a symposium was counted as a separate speaker slot. We excluded problem-based learning sessions (any presentation with “problem-based learning” or “PBL” in the title), workshops, abstract presenters, and moderator positions.

Data collection and outcome measures

Data were extracted from the conference programs that are published online annually. For each speaker slot, we extracted the following information: speaker name, specialty track, conference year, and the total number of presenters in their session. We also noted groups of presentations (i.e., symposia panels) that were considered as groups of two or more speakers in a session on a similar theme, grouped in the program. The symposia subject areas were divided *a priori* into different subspecialties, including obstetric anesthesia, education and research, global health, pediatric anesthesia, patient safety and ethics, anesthesia assistants, perioperative medicine, regional anesthesia and pain, neuroanesthesia, cardiothoracic anesthesia, and transplant anesthesia and critical care.

The terms *sex* and *gender* are often conflated, but are distinct; we have previously differentiated between the two.^{6,12,21} Gender was assigned to each presenter in a similar fashion to our previous studies based on a gender binary system (i.e., man or woman).^{6,12} Briefly, we assigned gender using one or more of the following: 1) review of the speaker’s first and middle names; 2) internet search of the author’s name to find reference to their gender; or 3) search of the speaker’s first name (<https://www.genderchecker.com/>). When we were unable to assign gender with confidence to a speaker, he/she was omitted from the analysis.

Symposia subspecialty subject areas were assigned to the individual (if one presenter) or symposium (multiple presenters) based on the assigned specialty track and the title of the presentation or symposium. We collapsed symposia subspecialty subject areas with lower numbers of speakers into broader categories. For example, conference sessions on anesthesia assistants were included under “Perioperative Medicine,” and “Global Health” sessions were included under “Education and Research.” Where multiple specialties were applicable, the most relevant was selected by consensus (this occurred in a small minority of sessions).

The CAS does not collect information on the proportion of women members of the CAS (except for voluntary gender disclosure that began in 2019); therefore, we compared the gender of speakers to the proportion of women anesthesiologists in Canada, obtained from the

Canadian Medical Association (CMA) (<https://www.cma.ca/Assets/assets-library/document/en/advocacy/profiles/anesthesiology-e.pdf>) as previously described.⁶ These data were used to estimate the expected proportion of women speakers at the CAS meeting for each year.

Statistical analysis

Speaker information was described using mean (standard deviation), median [interquartile range], and percentage (%). The relationship between the proportion of women speakers and their representation in the Canadian anesthesiology workforce during the study period was first examined using graphical representation, followed by comparison with the proportion of women in anesthesiology in Canada using a one sample test of proportions. The associations between conference year and proportion of women speakers, as well as subspecialty group and proportion of women speakers, were analyzed using simple logistic regression. All data analysis was performed using STATA 12.1 (StataCorp, TX, USA). A $P < 0.05$ was considered statistically significant.

Results

We identified 1,265 presenter slots during the 2007–2019 CAS annual meetings. Speaker name or gender was missing in nine cases, and subspecialty was missing in two slots (because the subspecialty category and presentation titles were lacking), leaving 1,256 and 1,254 speaker slots for each analysis, respectively. Within these speakers, we identified a total of 313 symposia. Two symposia were missing speaker information (one cardiothoracic, one obstetric), leaving 311 symposia for this part of the analysis.

Speaker gender distribution and proportion in Canada

Women made up 28.5% of speakers over the study period ($n = 358$) compared with 71.5% men ($n = 898$). The proportion of women speakers increased over the study period and was associated with conference year (OR per year, 1.04; 95% confidence interval, 1.01 to 1.07; $P = 0.02$) (Table 1). The average percentage of women speakers at the CAS annual meeting (28.5%) was similar to the average percentage of women anesthesiologists in Canada (26.7%) over the study period ($P = 0.15$) (Fig. 1, Table 2). Encouragingly, the proportion of women speakers in the most recent year (2019) was the highest ever (47 out of 118, 40%) and could exceed the proportion of women anesthesiologists in Canada (data not yet available from the CMA for 2019).

Table 1 Relationship between conference year and subspecialty with woman speakers at the Canadian Anesthesiologists' Society annual meeting

Variable	Odds ratio (95% confidence interval)	<i>P</i> value
Year (OR per year)	1.04 (1.01 to 1.07)	0.018
Sub-specialty designation		
Obstetric anesthesia	3.67 (2.31 to 5.85)	< 0.001
Patient safety and ethics	1.28 (0.79 to 2.08)	0.312
Education and research	1.29 (0.87 to 1.91)	0.200
Pediatric anesthesia	1.30 (0.82 to 2.08)	0.266
Perioperative medicine	Reference	
Regional anesthesia and pain medicine	0.83 (0.55 to 1.25)	0.362
Neuroanesthesia	0.65 (0.36 to 1.18)	0.158
Cardiothoracic anesthesia	0.48 (0.27 to 0.85)	0.012
Transplant anesthesia and critical care	0.06 (0.008 to 0.42)	0.005

Fig. 1 Proportion of women speakers at the Canadian Anesthesiologists' Society (CAS) annual meeting over time, compared with the proportion of women anesthesiologists in Canada (source: Canadian Medical Association, <https://www.cma.ca/physician-data-centre>) **Table 2** Gender distribution of speakers, stratified by the number of symposium size

Year	Number of sessions (<i>n</i>)	Percentage women speakers mean (SD)	All men speakers <i>n</i> (%)	All women speakers <i>n</i> (%)
One speaker	374	113 (30)	261 (70)	113 (30.2)
Two speaker panels	127	28 (34)	70 (55)	13 (10)
Three speaker panels	133	29 (28)	52 (39)	4 (3)
Four + speaker panels	51	27 (29)	21 (41)	1 (2)

SD = standard deviation

Speaker gender by year and subspecialty group

The proportion of women speakers varied significantly by subspecialty group (Table 1 and Fig. 2; eTable 1 available as Electronic Supplementary Material [ESM]). Compared with the overall average representation, women were significantly more highly represented in obstetric anesthesia, with lower representation in cardiothoracic anesthesia, transplant anesthesia, and critical care specialties (Table 1, Fig. 2).

Gender representation on speaker symposia

The proportion of women speakers at the 311 symposia included in the analysis was similar (Table 2, ESM eTable 2). Overall, 146 (46%) of symposia were made up of all men speakers, ranging from 32% in 2019 to as high as 67% in 2009 (ESM eTable 2); 18 out of 311 (6%) of symposia were made up of all women speakers, ranging from 0% in 2009, 2010, and 2015 to a high of 14% in 2008. The representation of women was similar between different symposia sizes (Table 2).

Discussion

Our study results provide a comprehensive picture on the gender composition of speakers at the CAS annual meeting from 2007 to 2019, inclusively. Our results show that, on the whole, the gender composition of speakers reflected the gender composition of anesthesiologists in Canada with both gradually increasing over time, although women remain underrepresented compared with men overall. The

representation of women speakers was uneven, with wide variations between symposia subspecialty subject areas. While women were overrepresented amongst speakers in obstetric anesthesia, they were significantly underrepresented in cardiothoracic, transplant, and critical care, an observation that requires further investigation. Lastly, nearly half (46%) of symposia were made up of only men.

Active participation in societies such as the CAS is an important opportunity for women to build social and professional networks, to demonstrate innovation, to gain recognition for their successes, and to support their academic advancement.^{19,20} Enhancing the visibility of women and other marginalized individuals is crucial to professional networking and in being a role model for trainees who may be contemplating a career in anesthesiology. Encouragingly, our results show that women are represented as speakers similarly to the anesthesiology workforce in Canada. Less encouragingly, although unsurprisingly, given their representation in the profession, women remain underrepresented relative to men as speakers, which reflects a broader systemic issue in anesthesiology. The reasons behind this are not clear and indicate a need for further research into the barriers for women entering the profession; we suggest quantitative and qualitative research to better understand these barriers and potential attrition during the career trajectory.

Single-gender symposia were common irrespective of symposium size with all-male symposia being much more common than all-women symposia; similar findings were presented at the American Society of Anesthesiologists.¹⁹ Several factors may play a role in this observation, including nepotism.^{19,22} Policy implementation at the

Fig. 2 Proportion of women speakers at the CAS annual meeting stratified by subspecialty group assignment. The solid black line represents the overall percentage of women speakers averaged over the study period

society level requiring gender diversity of symposia is increasingly common, and may reduce the frequency of the “*manel*”, a term used to describe an all-men panel that first entered into the Oxford Dictionary in 2017.²³ Ensuring that both genders are visible in speaking roles can have an impact on the career trajectory of academic female anesthesiologists and provide them the opportunity to nationally broadcast their research endeavours, enabling them to progress to higher academic ranks when the time comes for promotion.

The uneven representation of women across different symposia subspecialty subject areas warrants further consideration. In particular, the contrast between obstetric anesthesia and transplant anesthesia/critical care is stark. This observation is likely multifactorial and may include factors such as a limited pool of individuals participating in academic medicine in these areas, implicit bias, and the possibility that women are invited but decline at higher proportions than men.¹⁸ Nevertheless, prior studies have not supported the latter hypothesis^{24,25} and causal factors need to be better characterized. Consistent with our findings, a recent study of authorship in anesthesiology found that women made up the highest percentage of first authors in obstetric anesthesia and the lowest in cardiac anesthesia.⁷ Nevertheless, women contributed to only 2% of all speakers within the transplant anesthesia and critical care-based symposia during the study period, below what Mehta *et al.* found where 5–31% of speakers at critical care medicine conferences were women.¹⁸ In 2018, according to the CMA physician data, 27.7% (139/501) of critical care physicians were women,²⁶ which similarly does not account for this discrepancy. Future research and interventions should focus on the factors that encourage women towards academic obstetric anesthesiology and away from specialties such as cardiothoracic anesthesia, whether systemic factors play a role, and ensuring women are offered opportunities as speakers.

Women were absent as speakers on nearly half (46%) of symposia at the CAS annual meeting. A lack of visibility of women in academic conferences is not desirable. Through a feminist theoretical lens, the question of access to discourse (i.e., how women possess less speaking rights to men) makes it difficult for women to speak at conferences when traditionally, these roles were predominantly created for and occupied by men.²⁷ *Manels* further silence women, not only from a lack of representation on a single-gender symposium, but from institutionalized limitations which make public speaking uncomfortable for some women²⁸ as discursive rules exist that create power struggles based on perceived hierarchy.²⁹

Our analysis has several limitations. We do not know the proportion of women CAS members (data unavailable), and the proportion of women practicing anesthesiology in

Canada is derived from self-reported survey data at the CMA, thereby remaining non-inclusive.⁶ In addition, these data may not reflect the proportion of women participating in academic anesthesiology. Despite these limitations, this remains the best available data for comparison. In addition, gender was assigned based on name, despite gender being a self-reported identity and we may have made erroneous assignments. Another limitation is assigning gender binaries (i.e., man or women), disregarding all other gender identities (e.g., non-binary), and homogenizing all women rather than further analyzing intersecting social constructs. Furthermore, not all speakers were anesthesiologists or Canadian, and the representation of women in these populations may be different.

Encouragingly, our study results show that women are represented as speakers at the CAS annual meeting in a similar proportion to their representation in the anesthesiology workforce. Nevertheless, this representation was uneven with women being overrepresented in obstetric anesthesia, and significantly underrepresented in the cardiothoracic anesthesia, transplant anesthesia, and critical care-based symposia. In addition, we found that nearly half of the symposia did not include any women, which may further perpetuate their underrepresentation. Overall, we identified several areas to improve the visibility of women as speakers at the CAS annual meeting and suggest consideration of policies to reduce barriers.

Author contributions Gianni R. Lorello contributed to the study concept and design, primary data collection, analysis and data interpretation, manuscript drafting, and critical revision of the manuscript for intellectual content. Arun Parmar contributed to the primary data collection and to verification, analysis, and interpretation of data. Alana M. Flexman contributed to the study concept and design, primary data verification, statistical analyses, and critical revision of the manuscript for intellectual content.

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